

**RESPONSE TO U.S.ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE  
DRAFT PROPOSED PLAN  
JANUARY 4, 2013  
SITE ST012, FORMER WILLIAMS AFB, MESA, ARIZONA**

Item	Page	Section/ Paragraph	Line	Comment	Response to Comment
General Comments					
1		Figure 1B		This diagram appears to highlight the fact that 20 years have passed between the first ROD and this ROD amendment, and that the site has not progressed beyond RI/FS. EPA suggests the incorporation of a timeline of dates that indicates events such as failure of first remedy, progress with SVE system, and successful Thermal Enhanced Extraction (TEE) pilot study to explain the 20 year gap between RODs and also an anticipated schedule for remedy completion.	A new figure (Figure 1c) has been provided that presents the time line for the site with activities and documents over the period from 1983 to the completion of construction and start of operation shown.
2		I		Please incorporate a table to graphically summarize the results of the 9 criteria analysis.	A table has been added.
Specific Comments					
1	1,2	A,C		The proposed abbreviation "Williams" for the former Williams Air Force Base is not appropriate because there is currently a city in Coconino county, Arizona named Williams (population 3,000.) Please consider using the abbreviation "former WAFB" instead of "Williams" to avoid confusion.	"Air Force Base" has been abbreviated as "AFB" and the former base is referred to as "former Williams AFB".

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2	2	B		The last sentence of this section seems out of place as it refers to the soil remedy, and this proposed plan covers the ground water remedy.	The sentence has been deleted.
3A	4	C.2		The “site boundary” as defined and represented by surface features on figure 3 is misleading and confusing. Instead, please show the lateral distribution of the plume as defined by monitoring data and indicate the vertical distribution. Also, please include the reference for the remaining estimated 2.2 million gallons of light non-aqueous phase liquid (LNAPL).	<p>The “site boundary” is the same defined area used throughout the TEE and FFS documents but has been removed to avoid confusion. The lateral distribution of the plume as defined by the monitoring data is illustrated by the two contour lines already provided. To help clarify the vertical distribution the depth intervals of the UWBZ and LSZ have been added.</p> <p>The reference for the estimated 2.2 million gallons of LNAPL in the saturated zone has been added (the TEE Pilot Test Report).</p>
3B	5	C.2		The last two sentences of this section mention the Thermal Enhanced Extraction (TEE) pilot test that was performed for this site. While TEE is not the chosen technology for the site, it has the same basis (steam injection and extraction) as the chosen technology, and the pilot demonstrated that the technology will enhance the recovery of NAPL. Additional explanation is warranted on the relationship between the TEE Pilot test and Steam Enhanced Extraction (SEE) as discussed in the Proposed Plan Preferred Alternative 3. The explanation should clarify clearly that the pilot was successful and	<p>The last two sentences of section C.2 have been modified to read, “The Air Force conducted a Thermal Enhanced Extraction (TEE) pilot test in 2008 and 2009 to evaluate the effectiveness of the technology. The TEE pilot test successfully demonstrated that the technology, using steam injection and liquid/vapor extraction, was safe and effective at removing LNAPL and treating the dissolved phase plume.”</p> <p>For the description of Alternative ST012-03 in Section H, the following has been added :</p>

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				that LNAPL was removed from the subsurface, and demonstrate that the proposed technology has already been implemented at the site at a smaller scale and it has been proven to be both safe and effective. The reader may not understand the statement on page 10, Section I, #3, that “The Alternative ST012-3 pilot test demonstrated that SEE is an effective technology....” or the statement on page 11, Section I, #8, that “The EPA and ADEQ have expressed support for steam enhanced extraction. .. since it has established during the TEE Pilot test as an effective technology...” unless explanation of how TEE is similar to SEE is provided.	<p>“Implementation of SEE would be similar to the technology successfully demonstrated by the TEE pilot test.”</p> <p>The sentence in Section I, #3 was modified to read, “The TEE pilot test demonstrated that SEE is an effective technology for Alternative ST012-3.”</p> <p>Technology definitions in the Glossary/Acronyms section have been updated as described in response to comments 11 and 12.</p>
4	6	D		Second paragraph: The statement that groundwater “Treatment is being pursued in order to bring concentrations down to drinking water standards...” does not specify if they are the Primary or Secondary Drinking Water Standards. Please reference the standards.	A detailed list of applicable standards and references would likely be confusing to most readers. The sentence has been revised to read, “Treatment is being pursued in order to reduce concentrations of contaminants of concern in groundwater to meet remedial action objectives.”
5	7	F		The first sentence indicates the incremental lifetime cancer risk from residential exposure to benzene is $6 \times 10^{-5}$ Was benzene the only risk driver? What was the exposure point concentration and exposure assumptions?	Other contaminants of potential concern were evaluated but benzene was the primary risk driver. The second sentence illustrates this as the total ILCR is the same as the benzene ILCR. The exposure point concentration and assumptions are detailed in the OU-2 RI. The

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					2nd sentence has been revised to read, "The total ILCR from all contaminants of concern associated with domestic use of groundwater (i.e., ingestion via drinking water and inhalation during showering) from OU-2 by a residential population is $6 \times 10^{-5}$ (IT, 1992a). Benzene contributes greater than 99% of the total ILCR."
6	7	F		The first sentence of the next to the last paragraph of this section states, "These potential risks would only exist if, after the Base is closed . . ." It is EPAs understanding that the Base has been closed for several years.	The phrase, "after the Base is closed," has been deleted.
7	7,8	H		Summary of Remedial Alternatives: The list of alternatives does not include institutional controls (ICs) as components of each alternative, and presumably, the costs of ICs are also not included. Please include ICs as a component for each alternative.	ICs are already in place as a component of the OU-2 ROD selected remedy. The deed and a Declaration of Environmental Use Restrictions (DEUR) limits the property to non-residential use, prohibits the installation of wells except for remediation or monitoring, and requires soil management procedures for soil excavated at depths of greater than 10 ft bgs. The following has been added to the end of the 2 <sup>nd</sup> paragraph in Section H: "Institutional controls to prevent groundwater use are already in effect for ST012 and will remain in effect as part of each alternative until action levels in soil and groundwater are achieved."

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					Because ICs are in place based on the OU-2 ROD selected remedy, there are no additional costs for ICs associated with the groundwater alternatives.
8	8,9	H		Alternative ST012-3, Steam Enhanced Extraction and Enhanced Bioremediation, Page 8, and Alternative ST012-4, Enhanced Bioremediation and Ozonation, Page 9: These alternatives do not list Monitored Natural Attenuation (MNA) as a component of the alternatives. Because the alternatives as described may not achieve drinking water standards during the active remediation phase (steam enhanced extraction or ozonation, respectively), please consider including MNA as a final component of each alternative, especially if drinking water standards are the remediation goals.	Text has been added as follows:  For Alternative ST012-3: After enhanced bioremediation, a period of monitored natural attenuation may be necessary until RAOs are achieved.  For Alternative ST012-4: A period of monitored natural attenuation may be necessary as a final step until RAOs are achieved.
9	9	H		The first partial paragraph states that vapors will be recovered from the soils. The explanation of the SEE process would be improved by stating that LNAPL and groundwater will also be recovered.	“(LNAPL and groundwater)”, has been added after “hot fluids”. In addition, comparison to the TEE pilot test has been added (see comment 3B) and the sentences reordered to read:  SEE involves the installation of a network of steam injection and liquid extraction wells, installation of temperature monitoring equipment, injection of steam into the wells, and extraction of hot fluids (LNAPL and

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					<p>groundwater) for on-site separation and treatment. The vapors produced are drawn from the soil by extraction wells that are installed as part of the SEE remedy. Implementation of SEE would be similar to the technology successfully demonstrated by the TEE pilot test. A generic sketch of the SEE process is presented in Figure 4. Figure 5 shows a ..."</p> <p>The definition of SEE has also been updated (see comment 11).</p>
10	10	I, #5		<p>This paragraph states that steam injection will have an impact on neighboring properties. The referenced potential impacts need to be clearly communicated here and not left to imagination.</p>	<p>The second sentence has been replaced with: "Due to the use of steam (high pressure and temperature) and its associated safety hazards in the immediate vicinity of the treatment system, Alternative ST012-3 poses a risk to workers and neighboring properties. The risk will be managed via on site safety procedures, restricted access to the site and, to the extent necessary, restricted access to neighboring roadways or properties (temporary road or area closures.)"</p> <p>In the last sentence of this paragraph, "both" was changed to "all".</p>

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11	14			Steam Enhanced Extraction definition: It is not clear why this definition would say the technology 'attempt' (sic) to volatilize contaminants — the technology does vaporize contaminants, and also recovers liquids. Also, above ground treatment of the recovered vapors and liquids are always required by this technology.	Definition has been revised to read, "A remediation approach that injects steam into the ground to heat the target media, mobilize and capture LNAPL, and volatilize (evaporate) contaminants. Contaminants are captured as liquids and vapors and processed by a treatment system."
12	14			Thermal Enhanced Extraction definition: This definition should clarify that the heat source employed by this technology is steam injected into the ground from the surface similar to SEE. This will help to clarify why the TEE pilot demonstrated that steam enhanced extraction will be effective for this site.	The following has been added to the end of the definition to help provide clarification:  "The TEE Pilot Test at the former Williams AFB used steam as the source of heat (see Steam Enhanced Extraction)."